



## Seq Listing 2-7-07.txt

<110> APPLICANT: National Renewable Energy Laboratory  
<120> TITLE OF INVENTION: Cellobiohydrolase I Gene and Improved Variants  
<130> FILE REFERENCE: NREL 99-45  
<140> CURRENT APPLICATION NUMBER: US/10/031,496D  
<141> CURRENT FILING DATE: 2002-01-14  
<160> NUMBER OF SEQ ID NOS: 96  
<170> SOFTWARE: PatentIn version 3.3

<210> SEQ ID NO 1  
<211> LENGTH: 28  
<212> TYPE: DNA  
<213> ORGANISM: Artificial  
<220> FEATURE:  
<223> OTHER INFORMATION: Primer for PCR  
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agagagtcta gacacggagc ttacaggc 28

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<213> ORGANISM: Artificial  
<220> FEATURE:  
<223> OTHER INFORMATION: Primer for PCR  
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aaagaagcgc ggccgcgcct gcactctcca atcgg 35

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<213> ORGANISM: Artificial  
<220> FEATURE:  
<223> OTHER INFORMATION: Primer for PCR  
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ggcggaaacc cgctggcac cacc 24

<210> SEQ ID NO 4  
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<213> ORGANISM: Trichoderma reesei  
<220> FEATURE:  
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<222> LOCATION: (1)..(1545)  
<220> FEATURE:  
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<222> LOCATION: (1436)..(1550)  
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Met Tyr Arg Lys Leu Ala Val Ile Ser Ala Phe Leu Ala Thr Ala Arg  
1 5 10 15  
gct cag tcg gcc tgc act ctc caa tcg gag act cac ccg cct ctg aca 96  
Ala Gln Ser Ala Cys Thr Leu Gln Ser Glu Thr His Pro Pro Leu Thr  
20 25 30  
tgg cag aaa tgc tcg tct ggt ggc acg tgc act caa cag aca ggc tcc 144  
Trp Gln Lys Cys Ser Ser Gly Gly Thr Cys Thr Gln Gln Thr Gly Ser  
35 40 45  
gtg gtc atc gac gcc aac tgg cgc tgg act cac gct acg aac agc agc 192  
Val Val Ile Asp Ala Asn Trp Arg Trp Thr His Ala Thr Asn Ser Ser

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acg aac tgc tac gat ggc aac act tgg agc tgc acc cta tgt cct gac	Thr Asn Cys Tyr Asp Gly Asn Thr Trp Ser Ser Thr Leu Cys Pro Asp		240
65 aac gag acc tgc gcg aag aac tgc tgt ctg gac ggt gcc gcc tac gcg	Asn Glu Thr Cys Ala Lys Asn Cys Cys Leu Asp Gly Ala Ala Tyr Ala		288
tcc acg tac gga gtt acc acg agc ggt aac agc ctc tcc att ggc ttt	Ser Thr Tyr Gly Val Thr Thr Ser Gly Asn Ser Leu Ser Ile Gly Phe		336
gtc acc cag tct gcg cag aag aac gtt ggc gct cgc ctt tac ctt atg	Val Thr Gln Ser Ala Gln Lys Asn Val Gly Ala Arg Leu Tyr Leu Met		384
gcg agc gac acg acc tac cag gaa ttc acc ctg ctt ggc aac gag ttc	Ala Ser Asp Thr Thr Tyr Gln Glu Phe Thr Leu Gly Asn Glu Phe		432
tct ttc gat gtt gat gtt tcg cag ctg ccg tgc ggc ttg aac gga gct	Ser Phe Asp Val Asp Val Ser Gln Leu Pro Cys Gly Leu Asn Gly Ala		480
ctc tac ttc gtg tcc atg gac gcg gat ggt ggc gtg agc aag tat ccc	Leu Tyr Phe Val Ser Met Asp Ala Asp Gly Gly Val Ser Lys Tyr Pro		528
acc aac acc gct ggc gcc aag tac ggc acg ggg tac tgt gac agc cag	Thr Asn Thr Ala Gly Ala Lys Tyr Gly Thr Gly Tyr Cys Asp Ser Gln		576
tgt ccc cgc gat ctg aag ttc atc aat ggc cag gcc aac gtt gag ggc	Cys Pro Arg Asp Leu Lys Phe Ile Asn Gly Gln Ala Asn Val Glu Gly		624
tgg gag ccg tca tcc aac aac gcg aac acg ggc att gga gga cac gga	Trp Glu Pro Ser Ser Asn Asn Ala Asn Thr Gly Ile Gly Gly His Gly		672
agc tgc tgc tct gag atg gat atc tgg gag gcc aac tcc atc tcc gag	Ser Cys Cys Ser Glu Met Asp Ile Trp Glu Ala Asn Ser Ile Ser Glu		720
gct ctt acc ccc cac cct tgc acg act gtc ggc cag gag atc tgc gag	Ala Leu Thr Pro His Pro Cys Thr Thr Val Gly Gln Glu Ile Cys Glu		768
ggt gat ggg tgc ggc gga act tac tcc gat aac aga tat ggc ggc act	Gly Asp Gly Cys Gly Gly Thr Tyr Ser Asp Asn Arg Tyr Gly Gly Thr		816
tgc gat ccc gat ggc tgc gac tgg aac cca tac cgc ctg ggc aac acc	Cys Asp Pro Asp Gly Cys Asp Trp Asn Pro Tyr Arg Leu Gly Asn Thr		864
agc ttc tac ggc cct ggc tca agc ttt acc ctc gat acc acc aag aaa	Ser Phe Tyr Gly Pro Gly Ser Ser Phe Thr Leu Asp Thr Thr Lys Lys		912
ttg acc gtt gtc acc cag ttc gag acg tcg ggt gcc atc aac cga tac	Leu Thr Val Val Thr Gln Phe Glu Thr Ser Gly Ala Ile Asn Arg Tyr		960
tat gtc cag aat ggc gtc act ttc cag cag ccc aac gcc gag ctt ggt	Tyr Val Gln Asn Gly Val Thr Phe Gln Gln Pro Asn Ala Glu Leu Gly		1008
agt tac tct ggc aac gag ctc aac gat gat tac tgc aca gct gag gag	Ser Tyr Ser Gly Asn Glu Leu Asn Asp Asp Tyr Cys Thr Ala Glu Glu		1056
gca gaa ttc ggc gga tcc tct ttc tca gac aag ggc ggc ctg act cag	Ala Glu Phe Gly Gly Ser Ser Phe Ser Asp Lys Gly Gly Leu Thr Gln		1104
ttc aag aag gct acc tct ggc ggc atg gtt ctg gtc atg agt ctg tgg	Phe Lys Lys Ala Thr Ser Gly Gly Met Val Leu Val Met Ser Leu Trp		1152
gat gat tac tac gcc aac atg ctg tgg ctg gac tcc acc tac ccg aca	Asp Asp Tyr Tyr Ala Asn Met Leu Trp Leu Asp Ser Thr Tyr Pro Thr		1200

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385	aac gag acc tcc tcc	390	aca ccc ggt gcc gtg cgc gga agc tgc tcc acc	400	1248
Asn Glu Thr Ser	405	Thr Pro Gly Ala Val Arg Gly Ser Cys Ser Thr	410	415	
agc tcc ggt gtc cct gct cag gtc gaa tct cag tct ccc aac gcc aag	1296				
Ser Ser Gly Val Pro Ala Gln Val Glu Ser Gln Ser Pro Asn Ala Lys					
gtc acc ttc tcc aac atc aag ttc gga ccc att ggc agc acc ggc aac	1344				
Val Thr Phe Ser Asn Ile Lys Phe Gly Pro Ile Gly Ser Thr Gly Asn					
cct agc ggc ggc aac cct ccc ggc gga aac ccg cct ggc acc acc acc	1392				
Pro Ser Gly Gly Asn Pro Pro Gly Gly Asn Pro Pro Gly Thr Thr Thr					
acc cgc cgc cca gcc act acc act gga agc tct ccc gga cct acc cag	1440				
Thr Arg Arg Pro Ala Thr Thr Thr Gly Ser Ser Pro Gly Pro Thr Gln					
tct cac tac ggc cag tgc ggc ggt att ggc tac agc ggc ccc acg gtc	1488				
Ser His Tyr Gly Gln Cys Gly Gly Ile Gly Tyr Ser Gly Pro Thr Val					
tgc gcc agc ggc aca act tgc cag gtc ctg aac cct tac tac tct cag	1536				
Cys Ala Ser Gly Thr Thr Cys Gln Val Leu Asn Pro Tyr Tyr Ser Gln					
tgc ctg taa agctcc	1551				
Cys Leu					

&lt;210&gt; SEQ ID NO 5

&lt;211&gt; LENGTH: 514

&lt;212&gt; TYPE: PRT

&lt;213&gt; ORGANISM: Trichoderma reesei

&lt;400&gt; SEQUENCE: 5

Met Tyr Arg Lys Leu Ala Val Ile Ser Ala Phe Leu Ala Thr Ala Arg	
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Ala Gln Ser Ala Cys Thr Leu Gln Ser Glu Thr His Pro Pro Leu Thr	
20 25 30	
Trp Gln Lys Cys Ser Ser Gly Gly Thr Cys Thr Gln Gln Thr Gly Ser	
35 40 45	
Val Val Ile Asp Ala Asn Trp Arg Trp Thr His Ala Thr Asn Ser Ser	
50 55 60	
Thr Asn Cys Tyr Asp Gly Asn Thr Trp Ser Ser Thr Leu Cys Pro Asp	
65 70 75 80	
Asn Glu Thr Cys Ala Lys Asn Cys Cys Leu Asp Gly Ala Ala Tyr Ala	
85 90 95	
Ser Thr Tyr Gly Val Thr Thr Ser Gly Asn Ser Leu Ser Ile Gly Phe	
100 105 110	
Val Thr Gln Ser Ala Gln Lys Asn Val Gly Ala Arg Leu Tyr Leu Met	
115 120 125	
Ala Ser Asp Thr Thr Tyr Gln Glu Phe Thr Leu Leu Gly Asn Glu Phe	
130 135 140	
Ser Phe Asp Val Asp Val Ser Gln Leu Pro Cys Gly Leu Asn Gly Ala	
145 150 155 160	
Leu Tyr Phe Val Ser Met Asp Ala Asp Gly Val Ser Lys Tyr Pro	
165 170 175	
Thr Asn Thr Ala Gly Ala Lys Tyr Gly Thr Gly Tyr Cys Asp Ser Gln	
180 185 190	
Cys Pro Arg Asp Leu Lys Phe Ile Asn Gly Gln Ala Asn Val Glu Gly	
195 200 205	
Trp Glu Pro Ser Ser Asn Asn Ala Asn Thr Gly Ile Gly Gly His Gly	
210 215 220	
Ser Cys Cys Ser Glu Met Asp Ile Trp Glu Ala Asn Ser Ile Ser Glu	
225 230 235 240	
Ala Leu Thr Pro His Pro Cys Thr Thr Val Gly Gln Glu Ile Cys Glu	
245 250 255	
Gly Asp Gly Cys Gly Gly Thr Tyr Ser Asp Asn Arg Tyr Gly Gly Thr	

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Cys	Asp	Pro	Asp	Gly	Cys	Asp	Trp	Asn	Pro	Tyr	Arg	Leu	Gly	Asn	Thr
		275						280					285		
Ser	Phe	Tyr	Gly	Pro	Gly	Ser	Ser	Phe	Thr	Leu	Asp	Thr	Thr	Lys	Lys
	290					295					300				
Leu	Thr	Val	Val	Thr	Gln	Phe	Glu	Thr	Ser	Gly	Ala	Ile	Asn	Arg	Tyr
305					310					315				320	
Tyr	Val	Gln	Asn	Gly	Val	Thr	Phe	Gln	Gln	Pro	Asn	Ala	Glu	Leu	Gly
				325						330				335	
Ser	Tyr	Ser	Gly	Asn	Glu	Leu	Asn	Asp	Asp	Tyr	Cys	Thr	Ala	Glu	Glu
			340					345					350		
Ala	Glu	Phe	Gly	Gly	Ser	Ser	Phe	Ser	Asp	Lys	Gly	Gly	Leu	Thr	Gln
		355					360					365			
Phe	Lys	Lys	Ala	Thr	Ser	Gly	Gly	Met	Val	Leu	Val	Met	Ser	Leu	Trp
370					375					380					
Asp	Asp	Tyr	Tyr	Ala	Asn	Met	Leu	Trp	Leu	Asp	Ser	Thr	Tyr	Pro	Thr
385					390					395				400	
Asn	Glu	Thr	Ser	Ser	Thr	Pro	Gly	Ala	Val	Arg	Gly	Ser	Cys	Ser	Thr
				405					410				415		
Ser	Ser	Gly	Val	Pro	Ala	Gln	Val	Glu	Ser	Gln	Ser	Pro	Asn	Ala	Lys
			420					425					430		
Val	Thr	Phe	Ser	Asn	Ile	Lys	Phe	Gly	Pro	Ile	Gly	Ser	Thr	Gly	Asn
		435					440					445			
Pro	Ser	Gly	Gly	Asn	Pro	Pro	Gly	Gly	Asn	Pro	Pro	Gly	Thr	Thr	Thr
	450				455					460					
Thr	Arg	Arg	Pro	Ala	Thr	Thr	Thr	Gly	Ser	Ser	Pro	Gly	Pro	Thr	Gln
465					470				475					480	
Ser	His	Tyr	Gly	Gln	Cys	Gly	Gly	Ile	Gly	Tyr	Ser	Gly	Pro	Thr	Val
			485					490					495		
Cys	Ala	Ser	Gly	Thr	Thr	Cys	Gln	Val	Leu	Asn	Pro	Tyr	Tyr	Ser	Gln
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Cys	Leu														

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45

<210> SEQ ID NO 7  
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 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
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32

<210> SEQ ID NO 8  
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 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
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 cccataccgc ctgggcgcca ccagcttcta cggccc

36

<210> SEQ ID NO 9  
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<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
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<210> SEQ ID NO 10  
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 <220> FEATURE:  
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<210> SEQ ID NO 11  
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<210> SEQ ID NO 16  
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 <212> TYPE: DNA

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<213> ORGANISM: Artificial  
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 ggcgctggac tcacgctacg aacagcagca cg 32

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 <213> ORGANISM: Artificial  
 <220> FEATURE:  
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 gctgtctgga cggtgccgcc tacgcg 26

<210> SEQ ID NO 19  
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 cgcgtaggcg gcagggtcca gacagc 26

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 gcctctccat tggctttgtc accc 24

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<213> ORGANISM: Artificial
<220> FEATURE:
<223> OTHER INFORMATION: Primer for PCR
<400> SEQUENCE: 23
gcctctccat tccctttgtc accc
24

<210> SEQ ID NO 24
<211> LENGTH: 24
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<213> ORGANISM: Artificial
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gggtgacaaa gggaatggag aggc
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<210> SEQ ID NO 25
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ggccaacggt gagggctggg agcc
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<212> TYPE: DNA
<213> ORGANISM: Artificial
<220> FEATURE:
<223> OTHER INFORMATION: Primer for PCR
<400> SEQUENCE: 26
ggccaacggt ccgggctggg agcc
24

<210> SEQ ID NO 27
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<212> TYPE: DNA
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<220> FEATURE:
<223> OTHER INFORMATION: Primer for PCR
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ggctcccagc ccggaacggt ggcc
24

<210> SEQ ID NO 28
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ggctgggagc cgtcatccaa caacgcg
27

<210> SEQ ID NO 29
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<220> FEATURE:
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ggctgggagc cgccatccaa caacgcg
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 <213> ORGANISM: Artificial  
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 cgataccacc aagaaattga ccggtgtcac cc 32

<210> SEQ ID NO 32  
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 <213> ORGANISM: Artificial  
 <220> FEATURE:  
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 <212> TYPE: DNA  
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 <213> ORGANISM: Artificial  
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 cgagacgtcg ggtgccatca accgatac 28

<210> SEQ ID NO 35  
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 <220> FEATURE:  
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 cgagacgtcg ggtcccatca accgatac 28

<210> SEQ ID NO 36  
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 <213> ORGANISM: Artificial  
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 gtatcggttg atgggacccg acgtctcg 28

<210> SEQ ID NO 37  
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<213> ORGANISM: Artificial  
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 ggcgtcactt tccagcagcc caacgccgag cttgg 35

<210> SEQ ID NO 38  
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 ggcgtcactt tcccgcagcc ccccgccgag cttgg 35

<210> SEQ ID NO 39  
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 <220> FEATURE:  
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 ccaagctcgg cggggggctg cgggaaagtg acgcc 35

<210> SEQ ID NO 40  
 <211> LENGTH: 26  
 <212> TYPE: DNA  
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 <223> OTHER INFORMATION: Primer for PCR  
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<210> SEQ ID NO 41  
 <211> LENGTH: 26  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
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 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 41  
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<210> SEQ ID NO 42  
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 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
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 ccagaaccat gccgggagag gtagcc 26

<210> SEQ ID NO 43  
 <211> LENGTH: 34  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
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<210> SEQ ID NO 44  
 <211> LENGTH: 34  
 <212> TYPE: DNA

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<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
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<210> SEQ ID NO 45  
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 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
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 gcagggacac cggggctggt ggggcagctt ccgc 34

<210> SEQ ID NO 46  
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<210> SEQ ID NO 47  
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<210> SEQ ID NO 48  
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<210> SEQ ID NO 49  
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 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 50  
 ggcagcaccg gccccctcc cggcggcaac cc 32

<210> SEQ ID NO 51  
 <211> LENGTH: 32  
 <212> TYPE: DNA

## Seq Listing 2-7-07.txt

<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 51  
 gggttgccgc cgaggagggg gccggtgctg cc 32

<210> SEQ ID NO 52  
 <211> LENGTH: 36  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 52  
 ggctttgtca cccagtctgc gcagaagaac gttggc 36

<210> SEQ ID NO 53  
 <211> LENGTH: 36  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 53  
 ggctttgtca cccagggtgc gcagaagaac gttggc 36

<210> SEQ ID NO 54  
 <211> LENGTH: 36  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 54  
 gccaacgttc ttctgcgac cctgggtgac aaagcc 36

<210> SEQ ID NO 55  
 <211> LENGTH: 20  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 55  
 ccgataacag atatggcggc 20

<210> SEQ ID NO 56  
 <211> LENGTH: 20  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 56  
 ccgataacgc ctatggcggc 20

<210> SEQ ID NO 57  
 <211> LENGTH: 20  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 57  
 gccgcatag gcgttatcgg 20

<210> SEQ ID NO 58  
 <211> LENGTH: 30  
 <212> TYPE: DNA

## Seq Listing 2-7-07.txt

<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 58  
 cccggtgccg tgcgcggaag ctgctccacc 30

<210> SEQ ID NO 59  
 <211> LENGTH: 30  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 59  
 cccggtgccg tggccggaag ctgctccacc 30

<210> SEQ ID NO 60  
 <211> LENGTH: 30  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 60  
 ggtggagcag cttccggcca cggcaccggg 30

<210> SEQ ID NO 61  
 <211> LENGTH: 35  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 61  
 gctgaggagg cagaattcgg cggatcctct ttctc 35

<210> SEQ ID NO 62  
 <211> LENGTH: 35  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 62  
 gctgaggagg cagaagccgg cggatcctct ttctc 35

<210> SEQ ID NO 63  
 <211> LENGTH: 35  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primewr for PCR  
 <400> SEQUENCE: 63  
 gagaaagagg atccgccggc ttctgcctcc tcagc 35

<210> SEQ ID NO 64  
 <211> LENGTH: 29  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 64  
 ggaaccata ccgcctgggc aacaccagc 29

<210> SEQ ID NO 65  
 <211> LENGTH: 29  
 <212> TYPE: DNA

## Seq Listing 2-7-07.txt

<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 65  
 ggaaccata cgccctgggc aacaccagc 29

<210> SEQ ID NO 66  
 <211> LENGTH: 29  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 66  
 gctggtgtg cccagggcgt atgggttcc 29

<210> SEQ ID NO 67  
 <211> LENGTH: 34  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 67  
 cctaccgcac aaacgagacc tcctccacac ccgg 34

<210> SEQ ID NO 68  
 <211> LENGTH: 34  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 68  
 cctaccgcac aaacgccacc tcctccacac ccgg 34

<210> SEQ ID NO 69  
 <211> LENGTH: 34  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 69  
 ccgggtgtgg aggaggtggc gtttgctcggg tagg 34

<210> SEQ ID NO 70  
 <211> LENGTH: 32  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 70  
 ggactcacgc tacggccagc agcacgaact gc 32

<210> SEQ ID NO 71  
 <211> LENGTH: 32  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 71  
 gcagttcgtg ctgctggccg tagcgtgagt cc 32

<210> SEQ ID NO 72  
 <211> LENGTH: 32  
 <212> TYPE: DNA

## Seq Listing 2-7-07.txt

<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 72  
 ggactcacgc tacgaacagc agcacgaact gc 32

<210> SEQ ID NO 73  
 <211> LENGTH: 36  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 73  
 cccataccgc ctgggcgcca ccagcttcta cggccc 36

<210> SEQ ID NO 74  
 <211> LENGTH: 36  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 74  
 gggccgtaga agctggtggc gccagggcgg tatggg 36

<210> SEQ ID NO 75  
 <211> LENGTH: 36  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 75  
 cccataccgc ctgggcaaca ccagcttcta cggccc 36

<210> SEQ ID NO 76  
 <211> LENGTH: 41  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 76  
 ggactccacc tacccgacag ccgagacctc ctccacacc g 41

<210> SEQ ID NO 77  
 <211> LENGTH: 41  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 77  
 cgggtgtgga ggaggtctcg gctgtcgggt aggtggagtc c 41

<210> SEQ ID NO 78  
 <211> LENGTH: 41  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 78  
 ggactccacc tacccgacaa acgagacctc ctccacacc g 41

<210> SEQ ID NO 79  
 <211> LENGTH: 23  
 <212> TYPE: DNA

## Seq Listing 2-7-07.txt

<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 79  
 gctgaggagg cagaattcgg cgg 23

<210> SEQ ID NO 80  
 <211> LENGTH: 23  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 80  
 gctgaggagg cacgcttcgg cgg 23

<210> SEQ ID NO 81  
 <211> LENGTH: 23  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 81  
 ccgccgaagc gtgcctcctc agc 23

<210> SEQ ID NO 82  
 <211> LENGTH: 27  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 82  
 ggcaacgagc tcaacgatga ttactgc 27

<210> SEQ ID NO 83  
 <211> LENGTH: 27  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 83  
 ggcaacgagc tcgacgatga ttactgc 27

<210> SEQ ID NO 84  
 <211> LENGTH: 27  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 84  
 gcagtaatca tcgtcgagct cgttgcc 27

<210> SEQ ID NO 85  
 <211> LENGTH: 35  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 85  
 ccggtgtccc tgctcaggtc gaatctcagt ctccc 35

<210> SEQ ID NO 86  
 <211> LENGTH: 35  
 <212> TYPE: DNA

## Seq Listing 2-7-07.txt

<213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 86  
 ccggtgtccc tgatcaggtc gaatctcagt ctccc 35

<210> SEQ ID NO 87  
 <211> LENGTH: 35  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 87  
 gggagactga gattcgacct gatcagggac accgg 35

<210> SEQ ID NO 88  
 <211> LENGTH: 30  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 88  
 gctcaggtcg aatctcagtc tcccaacgcc 30

<210> SEQ ID NO 89  
 <211> LENGTH: 30  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 89  
 gctcaggtcg aatctcagtc tcccaacgcc 30

<210> SEQ ID NO 90  
 <211> LENGTH: 30  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 90  
 ggcgttgga gagcgagatt cgacctgagc 30

<210> SEQ ID NO 91  
 <211> LENGTH: 29  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 91  
 ccctatgtcc tgacaacgag acctgcgcg 29

<210> SEQ ID NO 92  
 <211> LENGTH: 29  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial  
 <220> FEATURE:  
 <223> OTHER INFORMATION: Primer for PCR  
 <400> SEQUENCE: 92  
 ccctatgtcc tgacgacgag acctgcgcg 29

<210> SEQ ID NO 93  
 <211> LENGTH: 29  
 <212> TYPE: DNA

## Seq Listing 2-7-07.txt

<213> ORGANISM: Artificial  
<220> FEATURE:  
<223> OTHER INFORMATION: Primer for PCR  
<400> SEQUENCE: 93  
cgcgccaggtc tcgtcgtcag gacataggg 29

<210> SEQ ID NO 94  
<211> LENGTH: 44  
<212> TYPE: DNA  
<213> ORGANISM: Artificial  
<220> FEATURE:  
<223> OTHER INFORMATION: Primer for PCR  
<400> SEQUENCE: 94  
gctcgaccct atgtcctgac aacgagacct gcgcgaagaa ctgc 44

<210> SEQ ID NO 95  
<211> LENGTH: 44  
<212> TYPE: DNA  
<213> ORGANISM: Artificial  
<220> FEATURE:  
<223> OTHER INFORMATION: Primer for PCR  
<400> SEQUENCE: 95  
gctcgaccct atgtcctgac gacgagacct gcgcgaagaa ctgc 44

<210> SEQ ID NO 96  
<211> LENGTH: 44  
<212> TYPE: DNA  
<213> ORGANISM: Artificial  
<220> FEATURE:  
<223> OTHER INFORMATION: Primer for PCR  
<400> SEQUENCE: 96  
gcagttcttc gcgcaggtct cgtcgtcagg acatagggtc gagc 44